

Contribution to the Knowledge of Phasmida II: Copulation with a spermatophore in *Baculum impigra* Brunner von Wattenwyl

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Introduction

Baculum impigra was originally described as *Cuniculina impigra* by Brunner von Wattenwyl (1907). It belongs to the family Phasmatidae and the subfamily Phasmatinae and is distributed in Tonkin (North Vietnam). It is an apterous, sticklike species, the male is ca. 76 mm long and the female is ca. 104 mm long. A full description of the male is given by Carlberg (a). Eggs were obtained from Dr. Don Graham (University of Kaiserslautern, Federal Republic of Germany). The insects were reared in room-temperature (18-25°C) and fed with *Quercus robur* L., *Sorbus aucuparia* L., *Rosa canina* L., *Betula pubescens* Ehrh., *B. verrucosa* Ehrh., *Rubus fruticosus* s.l. and sprayed daily with luke-warm water.

Since Clark (1974a) gave species of this group "English" names, I suggest "The Tonkin Stick" as an English name for this species.

In this paper the copulation and the spermatophore are studied.

Copulation

The copulation in this species is a rather typical Phasmid-copulation, so I will just describe its duration. The copulation starts at dusk, ca. 21.00 hours, and they remain in copula during the night. In the morning at about 08.00 — 09.00 hours they separate. This makes a duration of 11-12 hours. It seems to be a rather short time since e.g. Foucher (1916) reported 12-14 hours for *Cyphocrania gigas* L. and I (Carlbergb) reported 15-19 hours for *Extatosoma tiaratum* MacLeay.

Spermatophore

Spermatophores have only been recorded in three species of the stick and leaf insects before. It was first reported in the walking leaf *Phyllium bioculatum* Gray by Chopard (1934) and figured by him later (Chopard 1938). Favrelle (1938) found it in the stick insect *Phalces longiscaphus* de Haan, and Le Feuvre (1939) nearly simultaneously described it for the same species. Then nothing happened for a long time until Clark (1974b) described it in the stick insect *Extatosoma tiaratum* MacLeay.

The spermatophore of *B. impigra* is white in colour and is a sphere with a diameter of ca. 1 mm. It could be seen in the terminal segment of the female during the copulation and shortly after it.

The spermatophores in Orthoptera *sensu stricto* have a different shape (Chopard 1938), but for the few species of Phasmida they seem to have the same shape. They are small spheres with a little tube. When it is attached to the female's

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terminal segment, the sphere is only visible as a small white spot. Since they are so small (in diameter): 2 mm for *Phyllium*, 1 mm for *Phalces* and *Baculum*, 2-3 mm for *Extatosoma* it is surprising that they are noticed.

Both Chopard (1934) and Clark (1974b) suggested that it was likely that spermatophores were the normal method to transfer sperm in the Phasmida. Since *B. impigra* belongs to the same family as *E. tiaratum* I cannot add any new taxonomic range of the occurrence of spermatophores in this insect order — just give a new example that occurs. I believe that if we studied copulation in Phasmida more carefully, it is likely that spermatophores would be recorded in more species. At present it is only recorded in 0.16% of the species.

Postscript

Favrelle and Vichet in 1937 (*Comp. Rend. Acad. Sc.*, **204** (25): 1899-1900) published an account of the European stick insect *Bacillus rossius* (Rossius) where they mentioned the presence of the spermatophore during the copulation. This makes a total of five species of Phasmida with spermatophores.

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